capillary, unequal, mostly in fives below, above in twos or threes, the longer about 2 inches long, all naked below, and rather numerously flowered above; pedicels slender, as long as, to two or three times as long as, the spikelets, which are about 1½ lines long, narrowly lanceolate, and gradually tapering to the acute point, slightly scabrous on the keel, rather thin and purple; flowering glume a little shorter than the empty ones, narrowly lanceolate, five-nerved, apex rather obtuse; palet wanting. The panicle has a rich purple color, and it approaches the *A. scabra*, but is shorter, and with much shorter and erect branches, and a firmer culm. Collected in Oregon by Mr. Howell.

DEYEUXIA CUSICKII, V.—Culms from a strong creeping rhizome, stout, smooth, 4 feet high, radical leaves abundant, a foot long and 2 lines wide, tapering to a long point; culm leaves three or four, distant, long and wide like the radical ones; sheaths shorter than the internodes, smooth, striate, 4 to 8 inches long; ligule decurrent, thin, about 2 lines long, lanceolate at the apex; panicle 6 to 7 inches long, 1 inch or more wide, erect, the lower joints 1 inch apart; branches numerous, verticillate, mostly flowering to the base, the longer ones 1½ inches long, and naked below; empty glumes lanceolate, smooth, rather thin, about 2 lines long, strongly acute or acuminate, the lower one-nerved, upper three-nerved, and a little shorter; flowering glume nearly equaling the empty ones, narrowly lanceolate acuminate, smooth, thinnish, five-nerved, bifid at the apex, awn erect, inserted a little below the middle, slightly longer than its glume, hairs scanty, about half as long as the glume; palet nearly equaling its glume, thin, membranous.

A showy grass, with abundant foliage and rather ample panicle, collected in eastern Oregon at an altitude of 5,000 feet, by Mr. W. C. Cusick, who states that the radical shoots are abundant, but rarely sending up flowering culms.

Turner's New Desmids of the United States.

BY FRANCIS WOLLE.

It is with a feeling of much satisfaction that I have been observing the growing interest in the study of the Desmids, not only of foreign countries, but especially of the United States, and

the ready aid furnished to complete the list of our genera and species.

Among the most recent papers is a pamphlet of twenty pages and four plates, extracted from the Journal of the Linnean Society, (London, January, 1886,) by W. Joshua, F.L.S., containing a list of Burmese *Desmidieæ*, and descriptions of new species occurring in the neighborhood of Rangoon, the whole making a large and valuable accession to the knowledge of this family of Fresh-water Algæ.

Messrs. Roy and Bisset, of Aberdeen, Scotland, have made a useful print of a number of new forms mostly from Great Britain which came under their observation.

Thanks also are due to Prof. J. Schaarschmidt, of Hungary for calling attention, in this BULLETIN, to three species of American Desmids, noted in a work of P. Reinsch, 1875, omitted from my DESMIDS OF THE UNITED STATES. The three forms are *Xanthidium Nordstedtianum*, Reinsch, a *Cosmarium* without a name, and *Staurastrum pseudo-Cosmarium*. The first appears to be the same as *Xanthidium fasciculatum*, described and figured by Delponte in his DESMIDIACEARUM SUBALPINARUM, 1873. Differing considerably from the usually accepted form, I described it in this journal, January, 1885, as *X. fasciculatum*, var. *subalpinum*. Delponte's description was given two years earlier than that of Reinsch, and hence has the claim of priority. The second, *Cosmarium*, Dr. Schaarschmidt named *C. Reinschii*. The third is a form I have not recognized; it must be added to our list of Desmids.

Mr. Alfred W. Bennett, F.R.M.S., Lecturer on Botany at St. Thomas' Hospital, has published a paper of much interest in the February number of the Journal of the Royal Mic. Soc., "On the Fresh-water Algæ of the English Lake District, with descriptions of twelve new species," illustrated with two plates.

Mr. W. Barwell Turner, F.R.M.S., read a paper, November 11, 1885, before the Royal Microscopical Society, London, (see Journ. R. M. Soc., December, 1885 and Bull. Torr. Bot. Club, December, 1885), on what he believes are some new and rare Desmids of the United States, but which were mainly derived by him from sources that had been already examined and

reported upon by myself. His descriptions of American specimens, with few exceptions, embrace nothing that is either new or rare; he has been surprised into applying these adjectives to the immature or arrested growths and partial developments of plants previously described and classified. A few illustrations:—

The plant he designates as *Leptozosma catenula*, and for which he makes a new genus, is the undeveloped form of an old, well known species, *Desmidium quadratum*, which did not escape my attention when examining the material collected at Malaga, N. J. At first sight it struck me as a novelty, and not until many specimens were observed did the facts become evident. The process of development of the *Desmidieæ* is similar to that of the *Bambusinæ*, which is concisely represented in my Desmids U.S. (Compare p. 24, Plate I, Figs. 15-25.) The filaments are, primarily, entirely distinct in appearance from the mature plants. Unless traced through the various stages of growth they cannot be recognized. The same difficulty occurs with immature specimens of *Desmidium cylindricum;* they are entirely unlike the mature plants.

The form of *Desmidium quadratum* from the pond at Malaga, differs somewhat from the one illustrated, (l. c. Plate XLIX.) The cells are more quadrangular, angles sharper, not so rounded, and ends more suddenly attenuated by incurved lines; suture thick. These, like all other Desmids, are liable to many minor modifications, without destroying the specific character.

Cosmarium rostratum, n. sp., is the same as *C. aculeatum*, (l. c. Plate XVI., Fig. 15.) My description reads, "primarily more or less densely aculeated; later the aculei drop off" (p. 66.) When the description was written I had seen comparatively few specimens. The more usual appearance is with three or four small spines on or near the end of the cell, but indications of the existence of more can almost always be seen. My illustration represents, perhaps, an exception, rather than the ordinary form, hence I can readily see how Mr. Turner was misguided.

Euastrum Floridanum, n. sp., is not new; it is *E. ventricosum*, Lundell. After careful examination of many specimens, I have satisfied myself that it cannot be separated from Lundell's form (*vide* Des. U. S. p. 160). Single specimens may indicate some

slight variations, but these, among the many, cannot be taken for a new species.

Docidium occidentale, n. sp. Mr. Turner acknowledges to have seen but one-half of a cell of this Desmid. A new species on so slender a basis cannot be relied upon. Had he seen a fractional part of the hundreds which came under my observation, he would not have ventured a new name for *D. gracile*, Bail.

Staurastrum gladiosum, n. sp.—I fail to see how this form can be separated from *S. echinatum*, which is by no means a rare species, but varies considerably.

Euastrum pseudo-elegans, n. sp.—*E. elegans* is one of our most common forms of the genus; varieties are without number.

Euastrum coronatum, n. sp., appears to be simply a large form of *E. simplex*.

Cosmarium gemmatum, n. sp.—This is nothing more than a poor, imperfectly developed form of *C. triplicatum*, common in ponds near Minneapolis, Minn.; seldom as finely formed as in localities nearer the Atlantic.

Micrasterias mamillata, n. sp., was found in the same small cove in which *M. apiculata* abounds, and appears to be a form of that species.

The following: *Genicularia Americana*, n. sp.; *Penium spirostriolatum*, Barker; *Gonatozygon sexspiniferum*, n. sp., are forms I do not know, and for the present accept as new to our flora.

Of the value of the many varieties recorded I will say nothing, but merely make these general remarks. In the study of the Desmids, as in the study of other plants, the fact must not be overlooked, that none are subject to the mathematical rules of preciseness which govern the astronomer or the engineer in his calculations. Large allowances must be made for variations in the size and form. Two leaves from the same tree, or two roses from the same bush, will scarcely be found absolutely alike. Plants derived from seed out of the same pod may vary greatly, yet they will retain their specific characteristics.

For an idea of the variations among Desmids, reference may be made to Plate XXX., (Des. U. S.), eight quarter-cells of *M. Torreyi*; Plate XXXI., *M. radiosa*; Plate XXXVIII., *M. truncata*.

Patient study and unwearied examinations can alone decide

a new species, therefore these suggestions to all who take up the study of the Desmids. Do not be disturbed at the seeming incorrectness of the author; neither be too highly elated at the prospect of something new. If on the first examination of a plant it does not agree in every particular with the diagnosis, or with the illustrations, find another and another; soon the apparent differences may entirely disappear.

Notes on the Flora of the Hudson Highlands.

Seeing by a recent note in the BULLETIN that plants found in the Hudson Highlands are of interest, I send herewith a list, partly the result of my own gathering, partly made up from my father's notes, made in the vicinity of West Point.

Clematis verticillaris, D. C., among the rocks between Fort Putnam and peat bog, April 29, 1845, J. W. B.; *Ranunculus sceleratus*, L., J. W. B.; *R. fascicularis*, Muhl., spur of Crow's Nest, April, 1831, J. W. B.; *Thalictrum dioicum*, L., April 3, 1831, J. W. B.; *Caulophyllum thalictroides*, Michx., ravine on Crow's Nest, J. W. B.; *Adlumia cirrhosa*, Raf., Crow's Nest, J. W. B.; *Arabis lyrata*, L., all about Fort Putnam, 1879; *Polanisia graveolens*, Raf., Washington's Valley, July 27, 1831, J. W. B.; *Hibiscus Moscheutos*, L., near river, J. W. B.; *Tephrosia Virginiana*, Pers., J. W. B.; *Vicia tetrasperma*, Loisel., thicket on the north of Gee's Point, 1830, J. W. B.; *Acer Pennsylvanicum*, L., common at West Point; *Viburnum lantanoides*, Michx., top of Crow's Nest, 1879; *Triosteum perfoliatum*, L., August 22, 1831, J. W. B.; *Eupatorium sessilifolium*, L., August 23, 1835, J. W. B.; *Solidago latifolia*, L., ravine on Crow's Nest, and at Kosciusko's garden, 1830; *Xanthium strumarium*, L., swamp below Kosciusko's garden, 1828, J. W. B.; *Bidens bipinnata*, L., Chain Battery, 1879; *Cichorium Intybus*, L., on road to south wharf, 1879; *Lobelia Dortmanna*, L., Kronket's Pickerel Pond, September 10, 1831, J. W. B.; *Campanula rotundifolia*, L., top of Crow's Nest, 1879; *Epigæa repens*, L.; *Anagallis arvensis*, L., Washington's Valley, September 3, 1831, J. W. B.; *Asclepias quadrifolia*, L., and *A. verticillata*, L., J. W. B.; *Echium vulgare*, L,, Gee's Point, J. W. B.; it also grows on the road to the new railway station; *Scrophularia*